I Claim:

1. A method of producing an elemental material of Ti, Al, Sn, Sb, Be, B, Ga, Mo, Nb, Ta, Zr, V, Ir, Os, Re, U or an alloy thereof from a halide vapor of the elemental material or mixtures thereof comprising introducing the halide vapor or mixtures thereof into a continuum of a liquid alkali metal or a liquid alkaline earth metal or mixtures thereof to convert the halide vapor to elemental material or an alloy, said liquid alkali metal or liquid alkaline earth metal or mixtures thereof being present in an amount in excess of the stoichiometric amount needed to reduce the halide to cool the elemental material or alloy to temperatures below the sintering temperature thereof.

2. The method of claim 1, wherein the liquid alkali metal is Na, K or mixtures thereof and the liquid alkaline earth metal is Mg, Ca, Ba or mixtures thereof.

3. The method of claim 2, wherein the halide vapor is supplied at a pressure sufficient to maintain sonic flow.

4. The method of claim 3, wherein the elemental material is produced in batches ~~or continuously~~.

5. A method of continuously producing a non-metal or a metal or an alloy thereof comprising, providing a supply of halide vapor of the metal or non-metal or mixtures thereof, providing a supply of a liquid alkali metal or a liquid alkaline earth metal or mixtures thereof as a reducing agent, introducing the halide vapor in a continuum of the liquid alkali metal or alkaline earth metal or mixtures thereof at a velocity not less than the sonic velocity of the halide vapor to produce a powder of a non-metal or a metal or an alloy thereof and a halide of the alkali or alkaline earth

metal by an exothermic reaction, maintaining the temperature of substantially all of the powder produced below the sintering temperature thereof and separating the powder from the reactants.

16. The method of claim 15, wherein the halide vapor is one or more of $TiCl_4$, $AlCl_3$, $SnCl_2$, VCl_4, $NbCl_5$, $MoCl_4$, $GaCl_3$, UF_6, ReF_6.

17. The method of claim 16, wherein the halide vapor is $TiCl_4$, the liquid alkali or alkaline earth metal is Na, Mg or mixtures containing either Na or Mg is used, and the temperature of the liquid reducing agent away from where the halide vapor is introduced is maintained in the range of from about 200°C to about 600°C.

18. The method of claim 17, and further comprising separating the Ti produced by sequentially distilling the reducing agent leaving Ti and a salt, passivating the Ti with O_2 and thereafter rinsing with water to remove the salt.

19. A method of producing Ti powder from a source of $TiCl_4$ vapor, comprising introducing the $TiCl_4$ vapor submerged in liquid Na or Na with an alkaline earth metal to reduce $TiCl_4$ to a Ti powder and the halide salts of the Na or alkaline earth metals present and separating the Ti powder from the combination of Ti powder and unreacted metal and salt.

20. The method of claim 19, wherein substantially all of the Ti powder has a particle diameter in the range of from about 0.1 to about 10 microns.

21. The method of claim 19, wherein the $TiCl_4$ vapor is introduced into a flowing stream of liquid metal by injection.

22. The method of claim 21, wherein the flowing stream of liquid metal is present in excess over the stoichiometric quantity needed to react with the $TiCl_4$

vapor such that the Ti powder produced does not sinter.

19 13. A method of producing an elemental material or an alloy thereof from a chloride vapor of the elemental material or a mixture of ~~halide~~ chloride vapors of two or more elemental materials comprising the steps of introducing the chloride vapor or mixture of chloride vapors into a reaction zone in the interior of a flowing stream of a liquid alkali metal, a liquid alkaline earth metal, or any mixture thereof; intimately mixing the chloride vapor or mixture of chloride vapors with the flowing metal stream to cause a reduction reaction therebetween and form the elemental material or alloy thereof and a salt of the alkali metal, the alkaline earth metal, or any mixture thereof; and separating the elemental material or alloy thereof from the salt and unreacted metal.

15 14. The method of claim 13, wherein the temperature of the elemental material or alloy does not exceed its sintering temperature.

16 15. The method of claim 13, wherein the elemental material is one or more members selected from the group consisting of Ti, Al, Sn, Sb, Be, B, Ga, Mo, Nb, Ta, Zr, V, Ir, Os, Re, U and alloys thereof.

17 16. The method of claim 13, wherein said alkali metal is at least one member selected from the group consisting of Na, K and Li and said alkaline earth metal is at least one member selected from the group consisting of Ca, Mg, Sr and Ba.

18 17. The method of claim 13, wherein the chloride vapor is mixed with an inert gas.

19 18. A method of producing an elemental material of Ti, Al, Sn, Sb, Be, B, Ga, Mo, Nb, Ta, Zr, V, Ir, Os, Re, U or an alloy thereof from a halide vapor of the

elemental material or mixtures thereof comprising introducing the halide vapor or mixtures thereof into a liquid continuum of alkali metal or liquid alkaline earth metal or mixtures thereof to convert the halide vapor to elemental material or an alloy wherein the liquid continuum is present in sufficient quantity to maintain the temperature of substantially all of the reaction products below the sintering temperature thereof.

19. The method of claim 18, wherein the alkali metal is Na, K or mixtures thereof and the alkaline earth metal is Mg, Ca, Ba or mixtures thereof.

20. A method of producing Ti powder from a source of $TiCl_4$ vapor, comprising introducing the $TiCl_4$ vapor within a continuum of a liquid reducing metal principally of Na, Mg or mixtures thereof to produce Ti powder and a salt of the reducing metal or metals by a subsurface reaction and separating the Ti powder from the liquid reducing metal, wherein substantially all of the Ti powder has a particle diameter in the range of from about 0.1 microns to about 10 microns.

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